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The recent X–ray history of NGC 5506 S. Bianchi1, I. Balestra1, G. Matt1, M. Guainazzi2, G.C. Perola1

Stefano Bianchi

Dipartimento di Fisica, Università degli Studi Roma Tre, Italy XMM-Newton Science Operation Center/RSSD-ESA, Villafranca del Castillo, Spain

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We present a detailed discussion of the spectral and spatial components of NGC 5506, based on XMM–*Newton*, *Chandra* and BeppoSAX observations. The overall picture consists of a nucleus absorbed by cold gas with column density of $\approx 10^{22}$ cm^{-2} and surrounded by a Compton-thick torus, whose existence is inferred by a cold reflection component and an iron Kα line. On a much larger scale, a photoionized gas extended on $\approx$ 350 pc reprocesses the nuclear radiation, producing a soft excess and ionized iron lines. Noteworthy, we find no evidence for the presence of the accretion disc.

galaxies: individual: NGC 5506 - galaxies: Seyfert - X-rays: galaxies

Introduction

NGC 5506 hosts a nearby (z=0.006) AGN, rather bright in hard X-rays. It has been generally classified as a NELG. Recently nag02 observed the source in the near–IR and discovered an heavily reddened ($A_V \sim 5$) Narrow Line Seyfert 1 nucleus.

The source, being very bright, was observed by all X–ray satellites, starting with *Uhuru*. In recent times, it was observed by *Einstein* mac82, *EXOSAT* pounds89 and *Ginga* bmy93; the latter fitted the spectrum with a power law absorbed by neutral matter with column density of $3 - 4 \times 10^{22}$ cm^{-2}, plus a soft excess. Furthermore, the data showed a reflection component and an iron Kα line bmy93. Later on, *ROSAT* HRI images suggested that the soft emission is extended and coincident with the radio emission colbert98. Results from *ASCA* wang99, BeppoSAX per02 and an *RXTE* variability analysis lamer00 pointed out the complexity of the iron line profile, which was finally resolved by XMM-*Newton* in at least two components, the narrower at 6.4 keV being likely associated with the reflection component, arising from a neutral Compton-thick material Matt01. The origin of the bluer and broader component is less clear, but may be associated to the soft excess (see Sect. softpar). Finally, the source is variable on short time scales, but no long term trend has been found yet [e.g.][]papa02.

In this paper we present results from two XMM–*Newton* observations (the first one simultaneous with a BeppoSAX observation, see Matt01) and a *Chandra*/HETG observation. We have also reanalysed past BeppoSAX and ASCA observations (see Table log). All these observations will allow us to check and refine the interpretation proposed by Matt01 and bm02, in which the nucleus is surrounded by at least two reflecting regions, one Compton–thick and neutral and the other one Compton–thin and highly ionized, and obscured by a Compton–thin cold absorber.

We will assume $H_0 = 75$ km/s/Mpc throughout the paper.

dataObservations and data reduction

table[t]

logThe log of all analysed observations, and exposure times

center

tabularcccc Date Mission Instr. T_{exp} (ks)